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Decision-Maker Mindfulness in IT Adoption: The Role of Informed Culture and Individual Personality

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Abstract

This paper investigates the individual, organizational and innovation characteristics that determine decision-maker mindfulness in the adoption of IT innovations. Mindfulness has been defined as both trait-like, i.e., relatively stable and permanent, and state-like, i.e., situation or context specific. Based on a trait-like view of mindfulness, we identify the personality factors – openness to experience and conscientiousness as its determinants. Based on a state-like view, organizational culture, more specifically informed culture is identified as a determinant of decision-maker mindfulness. The moderating role of innovation radicalness is also investigated. The hypothesized relationships are validated using survey research and the findings indicate that decision-maker personality, as well as an informed culture within the organization are important in determining mindfulness, particularly when decision-makers are faced with deciding on the adoption of radical innovations.

Keywords: Mindfulness, informed culture, personality, IT adoption, survey research

Introduction

Information technology (IT) adoption decisions in organizations constitutes evaluating a multitude of factors within a given set of constraints. This typically results in a complex decision-making scenario for the organizational decision-makers. Previous research has identified several technology, organizational and environmental factors (commonly classified under the TOE framework) as significant in determining IT innovation adoptions. These factors are important in determining the adoption of IT innovations, however, they provide little understanding regarding the actual cognitive processes involved in the adoption decision making. More recently researchers have been focusing towards understanding the actual decision-making process and started using various psychological constructs and cognitive theories in innovation and strategic decision-making research to explain the cognitive processes involved in organizational innovation adoption decisions. Mindfulness is one such cognitive construct that has been introduced to investigate the differences in innovative behavior among organizations (Fichman 2004; Fiol and O'Connor 2003; Swanson and Ramiller 2004). In organizational decision-making, mindfulness is a characteristic that helps in making contextually differentiated interpretations of situations and information scenarios.

Adoption of IT innovations constitutes a complex information processing scenario that involves making sense of an information technology that the organization is unfamiliar with and is typically characterized by uncertainty and ambiguity over the outcomes of the innovation process. Although IT innovations are usually believed to be able to confer strategic and competitive benefits to the adopting organization, they are often complex technologies that call for significant investment of organizational resources. Thus, managers are faced with the task of analyzing the ramifications of the innovation on their organization. Under such circumstances, deciding on whether a particular innovation is a good thing for the organization, whether the timing of the innovation is appropriate, and how the adoption is best carried out requires organizational decision makers to attend to the innovation with reasoning grounded in their own facts and specifics (Fichman 2004).

Mindfulness in the context of organizational adoption of IT innovations corresponds to an engagement with a given innovation based on facts and details which are unique to the organization itself (Swanson and Ramiller 2004; Weick and Sutcliffe 2001). It has been suggested that mindfulness can reduce the possibility of failure when innovating with IT because mindfulness will result in a decision which is based on richer and more contextually relevant interpretation of a given situation (Fichman 2004; Swanson and Ramiller 2004). Therefore, decision-maker mindfulness is a desirable property in the process of adoption of IT innovations in organizations. Further, IT innovation adoptions are often prone to bandwagon behavior among organizations (Swanson and Ramiller 2004). It has also been shown that organizations feel mimetic, normative and coercive institutional pressures when deciding on innovations to adopt (DiMaggio and Powell 1983; Teo et al. 2003). While adoption decisions resulting from normative and coercive forces can be explained as being a strategic choice or requirement, it is likely that mindfulness in organizational decision-makers will help in overcoming the influence of mimetic institutional forces and the resulting bandwagon behavior.

This research is directed towards conceptualizing decision-maker mindfulness and outlining the factors that are relevant in determining decision-maker mindfulness when deciding on IT innovations. We believe that having a better understanding of decision-maker mindfulness will contribute towards understanding the overall IT adoption decision-making process in organizations, which constitutes a complex strategic decision-making exercise for organizational decision-makers.

Drawing from two streams of research which characterize mindfulness as (a) an individual level property (e.g., Langer 1989) and, (b) an organization level characteristic (e.g., Swanson and Ramiller 2004), this study conceptualizes decision-maker mindfulness in IT innovation adoption as an individual decision-maker's cognitive property, which is influenced by both – the context under which he operates and his individual traits or characteristics. The organization to which the decision-maker belongs provides the primary context to his decision-making. Therefore, informed culture, a particular aspect of organizational culture is considered as a determinant of mindfulness. Further, the role of decision-maker's personality, and the characteristics of the IT innovation are considered as determinants of decision-maker mindfulness. Therefore, this research highlights the importance of organizational culture in effective IT innovation related decision-making by allowing decision-makers to be more mindful in their decision-making tasks. It also provides means for identifying more efficient organizational decision-makers based on their individual traits. The proposed research model delineating the decision-maker mindfulness and its determinants is empirically validated by surveying organizational decision-makers.

Theoretical Foundations of Mindfulness

Mindfulness was introduced by Langer (1989) and is defined as a state of alertness and lively awareness that characterizes active information processing, creation and refinement of different categories and awareness of multiple perspectives. Mindfulness can be conceptualized as a cognitive ability or cognitive style (Sternberg 2000) that is reflected by (a) openness to novelty; (b) alertness to distinction; (c) sensitivity to different contexts; (d) awareness of multiple perspectives; and (e) orientation in the present (Langer 1997). Mindlessness, on the other hand, reflects the lack of these attributes. Thus, mindfulness captures a quality of consciousness that is characterized by clarity and vividness of current experience and functioning. In contrast, mindlessness is characterized by less conscious states, where people tend to function habitually and automatically (Brown and Ryan 2003).

Originally defined as an individual level characteristic, the notion of mindfulness was subsequently extended to the organization level (Weick 1995). At the organization level, mindfulness was defined as an organizational property or capability that allowed organizations to operate under conditions that are characterized by high risk of functional and technological complexity and with little scope to learn from trial and error. It was found that high reliability organizations (such as air traffic control systems, nuclear power generating plants, emergency departments in hospitals, etc.) successfully operate under such conditions and avoid failures and accidents by being (a) preoccupied with failure, (b) reluctant to simplify interpretations, (c) sensitive to operations, (d) committed to resilience, and (e) deferent to expertise. Accordingly, these five characteristics have been identified as the indicators of mindfulness of an organization in managing their day to day operations (Weick 1995; Weick and Sutcliffe 2001).

Although normal business operations are carried out by organizations under significantly less stringent conditions, inculcating the above characteristics in their organizational operations can reduce chances of failure by avoiding errors in the first place (Weick and Sutcliffe 2001). Thus, mindfulness can be thought of as a desirable property or state that all organizations, irrespective of their line of operation should strive to achieve, since it will make them more adept in managing unexpected circumstances.

Weick's (1995) conceptualization of mindfulness as a desirable organizational property was primarily in the context of managing day to day operations of organizations. Subsequently, researchers have extended the notion of mindfulness to study organizational engagement with innovations, because by its very definition, innovations incorporate concepts of newness or novelty, and IT innovations that are adopted in organizations are often characterized by new and complex technical knowledge and process changes, resulting in unexpected or uncertain outcomes. Organizational adoption of IT innovations thus underlines an organization's attempt to make sense of an uncertain situation that can result in unexpected outcomes, therefore, calling for mindfulness to be exercised when innovating with IT. Accordingly, mindfulness in organizational adoption of innovations has been receiving growing interest in recent years (e.g., Fichman 2004; Fiol and O'Connor 2003; Swanson and Ramiller 2004).

There are different interpretations of the role of mindfulness in the organizational adoption of innovations. Certain innovations are observed to give rise to a bandwagon behavior among organizations, where organizations end up adopting the innovation based on the perception that it is a well tried recipe for success (Spender 1989; Weick 1995) others having adopted it as well. By conceptualizing mindfulness as an individual level property, it has been proposed that mindfulness among organizational decision makers can prevent them from succumbing to such bandwagon behavior in the adoption of the innovation (Fiol and O'Connor 2003). The basic premise of this view is that greater mindfulness aids in an expanded environmental scanning for information and more context relevant interpretations of the available information, which leads to more discriminating decisions in the face of bandwagons. Similarly, mindfulness can also result in a decision to adopt an innovation where the bandwagon or popular behavior has been that of rejecting the innovation. Often innovations which are not considered fashionable by a majority opinion are rejected even though they may be highly suitable and beneficial for a particular organization. Thus, in contrast to traditional IS innovation research which is primarily concerned with explaining how to enhance or speed up adoption of innovations among a population of possible adopters (Fichman 2004), mindfulness can be used to explain both the adoption and rejection behaviors among organization. Hence, mindfulness provides innovation diffusion research means of overcoming the pro-innovation bias that it is often believed to suffer from (Fichman 2004; Kimberly 1981).

In IS innovation research, an organization is said to be mindful in innovating with IT when it attends to an innovation with reasoning grounded in its own organizational facts and specifics. Based on this definition, mindfulness can be characterized by contextually differentiated reasoning by the organization (Swanson and Ramiller 2004). Further, both mindfulness and mindlessness (an organizational characteristic that reflects a lack of

mindfulness) have been simultaneously juxtaposed over the whole innovation process, starting from pre-adoption engagement, to adoption and subsequent implementation of the innovation, and organization, environmental and technological characteristics of the IT innovation that result in mindful or mindless behaviors have been examined.

Determinants of Decision-makers Mindfulness in IT Innovation Adoption

The concept of mindfulness has been well discussed and analyzed; however, there is little existing research towards identifying factors that determine mindfulness, especially mindfulness in the context of organizational decision-making. Mindfulness has been defined as both – as a characteristic of the individual (Langer 1989), and as a property of the organization (Swanson and Ramiller 2004; Weick 1995). In order to conceptualize decision-maker mindfulness, we synthesize both of these characterizations of mindfulness to identify the antecedents of decision-maker's mindfulness in innovating with information technology.

We draw from research in cognitive psychology to identify the individual factors that affect mindfulness among organizational decision-makers. Although individual decision-makers contribute towards fostering mindfulness in the organization, it has also been suggested that mindfulness at the organization level is not necessarily reducible to mindfulness of any individual within the organization (Swanson and Ramiller 2004). Therefore, characteristics that define the organization as a whole, in which the individual decision-maker is a part of, will play a significant role in determining decision-maker mindfulness. In addition, the decision scenario in which mindfulness is being examined will play an important role in determining managerial mindfulness. For instance, mindfulness in carrying out day-to-day organizational operations is different from mindfulness in making out-of-the-regular decisions, such as adoption of IT innovations. The decision-context in this study is that of organizational engagement with IT innovations, and more specifically the adoption of RFID technology. Hence, the influence of the innovation's characteristics in determining decision-maker mindfulness is also considered.

Individual Factors: Personality

In psychology, mindfulness has been considered as a factor that enhances individual well-being and other well-being related outcomes (Kabat-Zinn 1990). Accordingly, research has been concerned with identifying interventions that can increase mindfulness among individuals. However, more recently researchers have started recognizing mindfulness as a naturally occurring characteristic that can differentiate individuals (Brown and Ryan 2003) by proposing that individuals differ in their propensity or willingness to be aware and to sustain attention to what is occurring in the present. Other attempts to conceptualize the construct of mindfulness, has suggested that mindfulness could be viewed as cognitive ability, or a personality trait, or as a cognitive style (Sternberg 2000). Viewing mindfulness as a cognitive ability suggests that people are likely to differ in their ability to think mindfully in the same way as they differ in terms of memory or intelligence. When viewed as a personality trait, the characteristic of mindfulness becomes akin a relatively stable individual disposition like the various personality traits such as conscientiousness, or extraversion of neuroticism. When visualized as a cognitive style, mindfulness represents a preferred way of thinking (Sternberg 2000). The above characterizations of mindfulness indicate that there are likely to be relatively stable individual differences in mindfulness. At the same time, it seems that individuals can be trained to think in a more mindful manner. Both of these observations have potent implications for organizations.

Based on the different conceptualizations of mindfulness in prior research, there appears to be some sort of relationship between individual mindfulness and human cognitions. An individual's cognitions, motivations and behaviors in different situations is often determined by his or her personality (Ryckman 2004). Therefore, we draw from personality psychology to determine the antecedents or individual variables that can predict decision-makers' mindfulness in organizational adoption of IT innovations.

The five human personality related traits or factors, commonly known as the Big-Five or the five factor model (McCrae and Costa 2003) are considered as one of the most stable and enduring characteristics that define human personality. The five factors of personality that have been measured and consistently received significant research support in a wide variety of research are neuroticism, extraversion, openness to experience, agreeableness and conscientiousness. Individuals have been found to possess varying levels of these factors. Each of these five factors is a broad dimension of personality that can be considered as a super-trait made up of several subordinate traits. For instance, the neuroticism trait is thought to be made up of the sub-traits of anxiety, hostility, depression, self-

consciousness and vulnerability. For the purpose of this research we focus only on the five super-traits, rather than on the more detailed sub-traits that constitute them.

The five personality factors tap into different aspects of human personality. Openness to experience indicates an appreciation for variety of experience, curiosity, imagination, art and unusual ideas. Conscientiousness reflects a tendency to show self-discipline, planned behavior, aim for achievement and act dutifully. Extraversion reflects energy, surgency, a tendency to seek stimulation and the company of others. Agreeableness reflects a tendency to be compassionate and cooperative, while neuroticism reflects a tendency to experience unpleasant emotions such as anger, anxiety and depression easily. These five factors together define the overall personality of an individual, however different factors are more relevant in explain different aspects of human behavior. Accordingly, past research on personality psychology and its implications has considered different personality factors depending on the research context. For instance, conscientiousness typically characterizes the need for achievement and is therefore likely to be relevant in studies that attempt to understand factors that cause individual differences on performances. Agreeableness and extraversion are considered important in studies that focus on social interaction skills in human beings. Similarly, neuroticism is typically associated with emotional and mental well-being.

Among the five factors, openness to experience is often associated with various cognitive skills and abilities in human beings (McCrae 1996). Openness to experience has been found to be associated with creativity and divergent thinking (McCrae 1987). It can be thought of as a motivational tendency to think about ideas, scrutinize information, and puzzle-solving. Openness to experience is a personality trait that distinguishes imaginative, inventive, reflective people from those who are conventional. People having low scores of openness are found to prefer familiarity over novelty and are usually resistant to change, while high scores involves receptivity to and interest in new experiences (McCrae and Costa 2003). Such receptive attention can support the assimilation of new ideas and feelings (Brown and Ryan 2003). One of the characteristics of mindfulness is openness to novelty (Langer 1989). A open and receptive awareness is a quintessential aspect of mindfulness (Martin 1997). Therefore, the personality trait of openness to experience is likely to be most strongly associated with mindfulness. It has also been suggested that there should be a thorough investigation of the relationship between mindfulness and openness to experience (Brown and Ryan 2003; Sternberg 2000).

For organizational decision makers, mindfulness in innovation adoption calls for expanded information processing and sense-making abilities. People who are imaginative and reflective are more likely to be able to make better sense of the available information. Natural tendencies towards scrutinizing information and problem solving can to a certain extent make one reluctant to simplify, which is one of the attributes of mindfulness (Weick and Sutcliffe 2001). Mindfulness also calls for an awareness of multiple perspectives (Langer 1989). In the context of organizational innovation adoption, this translates into taking account of the different ramifications of the innovation on the organization's operational and strategic advantages. Divergent thinking which is characterized by the ability to consider a variety of approaches to a problem simultaneously and elaborate on the details of an idea and carry it out (Guilford 1967), will make a person aware of the multiple perspectives and therefore have a positive influence on mindfulness in innovation adoption decision making. Divergent thinking in positively related to openness to experience (McCrae 1987). Openness to experience includes openness to ideas, experiences and values. Thus individuals scoring high on openness will be receptive of different ideas and viewpoints, and be able to simultaneously process and make sense of these multiple viewpoints, rather than being restricted by a single perspective. Therefore, possessing the personality trait of openness to experience is likely to make organizational decision-makers more mindful in deciding to adopt IT innovations.

> *H1: Openness to experience will be positively associated with mindfulness in IT innovation decision-making among organizational decision-makers.*

Conscientiousness is the personality trait that is characterized by purposeful planning and persistence in individuals. It contains elements of thoroughness, carefulness, organization, self-discipline and deliberation (McCrae and Costa 2003). Although, conceptually openness to experience is believed to have a closer association with individual mindfulness (Brown and Ryan 2003; Sternberg 2000), prior research has also suggested that there might be some relationship with conscientiousness as well (Sternberg 2000). Further, significant amount of prior research has found that conscientiousness is one of the best predictors of performance in the workplace across different categories of jobs (Salgado 1997). Therefore it is likely that conscientiousness will be associated with mindfulness, particularly, when analyzing mindfulness of organizational decision-makers, as opposed to just individual mindfulness.

A reluctance to simplify, commitment to resilience, and a preoccupation with failure are the hallmarks of mindfulness in an organizational context (Fiol and O'Connor 2003; Weick and Sutcliffe 2001). Strategic decision-

making in organizations (as is the case of IS innovation adoption) usually involves high levels of complexity. Under such circumstances most individuals are prone to rely on cognitive simplifying process to manage the complexity (Fiske and Taylor 1991). A reluctance to simplify indicates that organizational decision makers are willing to do the hard work which is required to fully understand a complex decision-making scenario. Personality traits of thoroughness, deliberation and persistence are likely to make an individual work towards fully understanding and contextually interpreting a complex innovation related decision making scenario.

Commitment to resilience is about recovering from failure or a setback. It is the overall capacity to investigate, learn, detect, contain and bounce back from inevitable errors (Weick and Sutcliffe 2001). Conscientious individuals often have a high need for achievement. This, along with a deliberate, thorough and persistent nature is likely to make individual decision-makers more committed to resilience in the organizational context. The need for achievement is also likely to make individuals pre-occupied with failure and device ways of getting over it. Further, organizational mindfulness calls for a deeper consideration of their own organizational particulars (Swanson and Ramiller 2004), and such a consideration can come about by individual characteristics of thoroughness, persistence and deliberation. Thus, conscientiousness among individuals will make them more mindful in an organizational decision-making context.

> *H2: Conscientiousness will be positively associated with mindfulness in IT innovation decision-making among organizational decision-makers.*

Organizational Characteristic: Informed Culture

Differences in organization culture give rise to variations in the cognitive styles of organizational managers and decision makers (Schein 1985). Since, mindfulness reflects an individual cognitive style (Sternberg 2000), we investigate the role that organizational culture plays in promoting mindfulness among its decision-makers. Organizational culture is a broad term essentially referring to a shared understanding of the reality by members of the organization. Among other things, organizational culture dictates the rules and norms within which an organization operates, governs the way in which members obtain information from the environment, and the way that the information is dealt with. Organizational culture also helps in differentiating between acceptable and unacceptable behaviors within the organization, and it governs the ways in which an organization deals with failure and mishaps, and how rewards systems are defined within an organization (Schein 1985).

Culture encompasses many things. Therefore, this study is interested in considering aspects of organizational culture that can have an impact on the decision-making styles of managers. Based on an analysis of the characteristics of high reliability organizations, the notion of informed culture has been put forward and described as a culture that fosters mindfulness among organizations (Weick and Sutcliffe 2001).

The concept of informed culture is derived from safety culture, which represents an organization's proficiency of, and commitment to their safety programs. Organizations that have a positive safety culture are characterized by shared perceptions of the importance of safety, communications founded on mutual trust and confidence in the efficacy of preventive measures (Reason 1997). Informed culture builds on and broadens the concept of safety culture, and is about strengthening the organization's defenses to prevent unfavorable incidents that can affect the organization as a whole from occurring. Therefore, informed culture necessitates sustaining an intelligent wariness within the organization.

An informed culture can be defined as an organizational culture that encourages reporting of errors and near misses, a culture that is just in terms of apportioning error when things go wrong, a culture that is flexible enough to be able to adapt to sudden and radical increases in pressure, pacing and intensity of organizational operations, and a culture that enables members of the organization to use lessons learnt from past experiences to guide present operations and assumptions. Thus, in essence, the informed culture makes the organization more tolerant, and indicates to its members that it is acceptable to report errors or incidents that could have lead to errors because it is unlikely that they will be blamed, punished or negatively evaluated for reporting such incidents. An informed culture creates an environment of trust and trustworthiness within the organization. It makes the organization better suited for adapting to changing demands by making timely and candid information available and encouraging learning from past experience and best practices. Accordingly, it has been proposed that these four components of the informed culture - reporting culture, just culture, flexible culture and learning culture can make an organization more mindful in managing unexpected occurrences, and preventing failures (Weick and Sutcliffe 2001).

When innovating with IT, decision makers in an organization are faced with a situation that can lead to unexpected outcomes. They are faced with information pertaining to a technology which is new to their organizational context and can bring about radical changes in the functioning of the organization, and at the same time, the cost of failure in the innovation initiative is high. Under such circumstances, an organizational culture that does not shy away from reporting about and analyzing unfavorable information will make decision makers more open towards considering both the favorable and unfavorable aspects of an IT innovation in the justification process involved in adopting an innovation.

Mindfulness calls for a contextually differentiated and thorough interpretation and analysis of the implications of the innovation based on an organization's own facts and specifics (Swanson and Ramiller 2004). This might result in decisions that go against a majority opinion, both within the organization (when other members of the organization harbor a different opinion regarding the organization), and outside the organization (when other organizations in the external environment have varying perceptions regarding the innovation). Further, since the outcomes of the innovation process can only be felt over a period of time and are not immediately visible, this makes it even more difficult for decision makers to justify their decisions when it goes against the bandwagon's decision. If an organizational culture is just in terms of apportioning blame and punishment when things go wrong, decision-makers within the organization will be more comfortable in making decisions that go against the general opinion when the situation calls for such a decision.

One of the characteristics of mindfulness is deference to expertise, which means that decisions should be made by people who are most qualified to make them, irrespective of what the organizational structure or hierarchy demands. An organization that can adapt to changing demands by shifting authority structures is said to possess a flexible culture (Reason 1997), that encourages deference to expertise when circumstances demand it.

Organizational learning is found to be a facilitator of the innovation process (Fichman and Kemerer 1997). Learning helps in overcoming the knowledge barriers that impedes the success of the organization with the innovation. Learning is especially valuable for technologies that are shrouded in significant amounts of uncertainty regarding outcomes (Brach 2003). A culture that encourages learning will assist decision makers in making a more informed decision by reducing the uncertainties associated with the technology. Thus, by encouraging reporting, justice, flexibility and learning, the informed culture of an organization will play a significant role in facilitating mindfulness in organizational decision makers when innovating with IT.

> *H3: Informed culture in the organization will be positively associated with mindfulness in IT innovation decision-making among organizational decision-makers.*

Innovation Characteristics: Radicalness

Other than the individual and organization characteristics discussed above, the decision-making context in which mindfulness is being studied will play an important role in determining the mindfulness of decision-makers. In the context of IT innovation adoption, the characteristics of the innovation that is being considered for adoption are likely to influence mindfulness in adoption decision-making. Prior innovation research has used radicalness as a primary attribute to distinguish between innovations (Wilson et al. 1999), and shown that innovation adoption is influenced by the degree to which innovations can be considered as either radical or incremental (Damanpour 1988, Dewar and Dutton 1986, Ettlie et al. 1984, Tornatzky and Fleischer 1990). In this context, radicalness is defined as the degree to which the innovation is a significant departure from existing technology used in the organization and incorporates new knowledge and technical expertise. Swanson and Ramiller's (2004) discourse on organizational mindfulness in IT innovation adoption suggests that radicalness of the innovation encourages the organization to behave mindlessly. Therefore, we propose that radicalness of the innovation will have an impact on the individual mindfulness of organizational decision-makers in IT innovation adoption.

Factors such as organizational structure and size and the existence of more specialized knowledge regarding the innovation are found to be significant in the adoption of radical innovations in organizations (Ettlie et al. 1984). This implies that the effect of radicalness of the innovation on its adoption is affected by organizational characteristics. Informed culture within the organization helps in determining decision-maker mindfulness by encouraging – reporting of facts even when things are not completely favorable, justice in apportioning blames and punishment when things go wrong, enabling authority to be granted to people with the appropriate expertise regarding the innovation, and facilitating learning from mistakes. These factors are likely to be important considerations when the innovation calls for a substantial departure from current practices within the organization. Therefore, when an

innovation is considered radical, informed culture will play a bigger role in determining decision-maker mindfulness. Accordingly, radicalness will positively moderate the relationship between informed culture and mindfulness in adoption decision-making.

> *H4a: The relationship between informed culture and mindfulness of organizational decision makers will be positively moderated by technology radicalness.*

The greater the difference between the innovation and the current technological setup within the firm, the more likely that firms will be tempted to dismiss their present circumstances as irrelevant or out-dated when considering the adoption of the innovation (Swanson and Ramiller 2004). Therefore, the general tendency within the organization will be to gloss over the firm's own facts and specifics, rather than scrutinizing them vis-à-vis the requirements of the innovation. Under such circumstances, thoroughness and meticulousness among decision-makers in considering the various aspects of a particular decision-making scenario is likely to have a stronger impact on mindfulness in adoption decision-making. Therefore, the relationship between conscientiousness and decision-makers mindfulness is likely to be positively moderated by the radicalness of the innovation.

> *H4b: The relationship between conscientiousness and mindfulness of organizational decision makers will be positively moderated by technology radicalness.*

Inherently, openness to experience indicates that individuals are capable of divergent thinking and are more receptive of new information. Since radicalness indicates the extent to which the innovation is new and significantly different from existing technologies, individuals who are more open to experience are likely to perceive the innovation as less different or new. Therefore, it is unlikely that radicalness will have any significant effect on the relationship between openness to experience and decision-maker mindfulness in IT adoption.

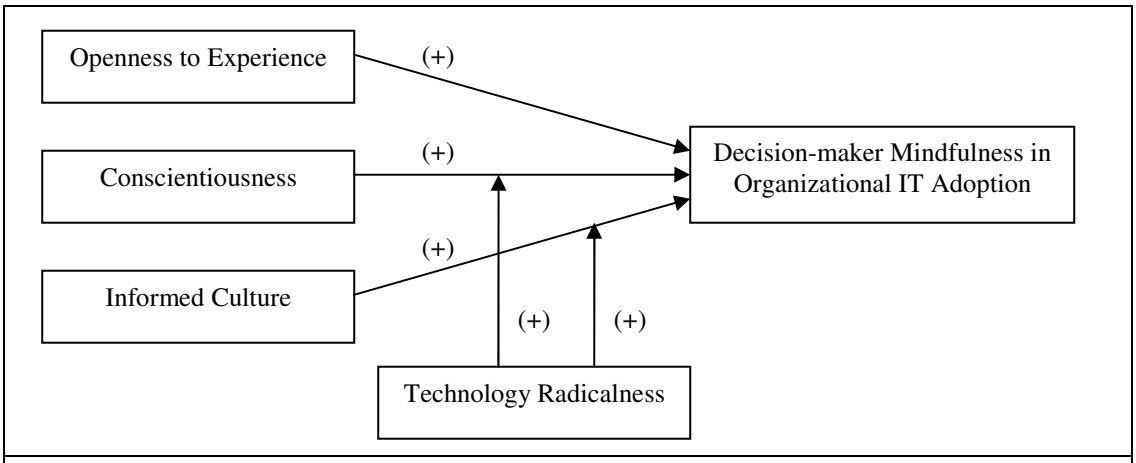

Figure 1. Determinants of Mindfulness in Decision-makers

Operationalization of Constructs

Where ever possible, validated instruments from previous studies were used to operationalize the constructs (Stone 1978). New measurement items were only developed for constructs where existing measures were not available or did not capture the complete notion of the intended construct. IS faculty members from a large Singaporean university were asked to assess the initial face and content validity of the measurement items and their feedback was used to refine the items. Following this, two rounds of questionnaire sorting exercise (labeled and unlabeled) was carried out (Moore and Benbasat 1991). Four graduate students participated in each sorting exercise. For the unlabeled sorting exercise, the labels that the sorters came up with closely corresponded with the actual construct names and on the average more than 80 percent of the items were correctly sorted into their intended constructs. After refining the measurement items based on the results of the unlabeled sorting exercise, the labeled sorting exercise – in which the sorters were provided with the name and definition of each construct – resulted in an average of 94% of the items getting correctly sorted into their intended constructs, thus indicating a high level of face and

content validity. The complete questionnaire was also assessed by researchers and practitioners for complexity or ambiguity of framing the questions. Items were reworded or refined based on their feedbacks.

Personality Factors

The two personality factors – openness to experience and conscientiousness were measured as broad domains of human personality using 10-item indicators from the international personality inventory pools (Goldberg et al. 2006, IPIP 2008).

Informed Culture

Informed culture comprises four components of organizational culture – just culture, reporting culture, flexible culture and learning culture. Based on a definition of these four constituents of informed culture (Weick and Sutcliffe 2001), a formative scale was developed to capture each of these aspects of informed culture.

Decision-maker Mindfulness in RFID Adoption

Mindfulness is defined as attending to the innovation with reasoning grounded in one's own organizational facts and specifics (Swanson and Ramiller 2004). Previous measures of mindfulness when available (such as, Brown and Ryan 2003) are primarily targeted towards measuring individual mindfulness as a purely psychological construct. Our conceptualization of mindfulness is somewhat different and no existing scales that measure mindfulness in the context of innovation adoption decision-making could be found. Therefore, a four item measurement scale was developed to capture decision-maker mindfulness in adoption decision-making.

Radicalness

Radicalness is the extent to which the innovation is a significant departure from existing technology used in the organization and incorporates new knowledge and technical expertise. Radicalness was measured using a three item measurement scale based on Dewar and Dutton (1986).

Methodology

Data Collection

The research model for this study was validated using survey research methodology. Survey forms were mailed to top executives (CEO, CIO, Managing Director, etc.) of a list of firms obtained from the Singapore 1000 database. The survey questionnaire was accompanied with a cover letter with a brief description of the research project, and the recipient was requested to fill up the survey, or pass it on to a decision-maker within the organization who played a more prominent role in IT adoptions. The respondent was requested to focus on the adoption of a specific IT innovation – RFID, when responding to the survey. The questionnaire contained a brief description of the RFID technology and some indicatory uses of the RFID technology in an organization. A total of 724 surveys sent out, and we received 159 responses, thus giving a response rate of 21.96%. A copy of the completed research report and findings was promised as an incentive to the respondents. The completed survey forms were returned to the authors in envelopes with pre-paid postage. Out of the 159 responses received, 134 were completed responses and were therefore used in this study.

Among the 134 usable responses, respondents were primarily top-level senior executives within the organization, 75% of them having more than 10 years of overall experience and held job titles such as CIO, COO, Vice-President, Executive Director, General Manager and Senior Manager. In terms of educational qualifications, 40% of the respondents held post-graduate or above degrees, while 48% were graduates, the remaining had high school education or diplomas.

Measures

All items in the survey questionnaire were measured on a 7-point likert scale ranging from 1 = strongly disagree to 7 = strongly agree. Table 1 lists the measurement items used to measure each of the constructs. Three of the constructs of this study – Openness to Experience, Conscientiousness and Informed Culture were measured using formative indicators, while Mindfulness and Radicalness were measured using reflective scales.

Table 1. Operationalization of Constructs	
Construct (Abbreviation)	**Measurement Items**
Openness to Experience (PerOpen)	- I believe in the importance of art - I have a vivid imagination - I tend to vote for liberal political candidates - I carry the conversation to a higher level - I enjoy hearing new ideas - I am not interested in abstract ideas (-) - I do not like art (-) - I avoid philosophical discussions (-) - I do not enjoy going to art museums (-) - I tend to vote for conservative political candidates (-)
Conscientiousness (PerCons)	- I am always prepared - I pay attention to details - I get chores done right away - I carry out my plans - I make plans and stick to them - I waste my time (-) - I find it difficult to get down to work (-) - I do just enough work to get by (-) - I don't see things through (-) - I shirk my duties (-)
Informed Culture (InformCul)	In our firm, - the internal climate encourages people to report errors and near-miss situation - people are not blamed or punished for reporting errors or incidents that could have resulted in unfavorable outcomes - blame and punishment are justly apportioned when errors or unfavorable incidents occur - it is easy to adapt from a conventional hierarchical structure to a structure where control is held by the task experts depending on circumstances - it is possible to shift authority to professional experts when a situation calls for it - the internal environment encourages learning from available situational information - the internal atmosphere supports reforms and changes based on learning from previous incidents
Radicalness (Radical)	Compared to existing auto-identification technologies such as bar-code - RFID has significant new knowledge contained in the technology or process - RFID represents an improvement over the existing technology - RFID represents a major technological advance
Decision-maker Mindfulness in RFID Adoption (Mindful)	When considering RFID adoption - I take into account our firm's preparedness for the changes involved - my decision is based on reasoning grounded on our firm's own facts and specifics - I usually get new information from multiple sources for decision making - I am aware that there are multiple implications of RFID for our firm

Data Analysis and Results

The research hypotheses were tested using multiple regression analysis and moderated multiple regression (MMR) analysis in SPSS 16.0. Multiple regression is the appropriate method of analysis when the research problem involves a single dependent variable and two or more independent variables (Hair et al. 1998). MMR is an extension of MRA used to test the effects of multiplicative terms or interactions of factors (Sharma et al. 1981). This allows for testing both the direct and moderating hypotheses in the research model. Single scores were created for each variable and the assumptions of the multiple regression analysis assessed.

Measurement Model

The quality of the reflective indices can be assessed through measures of internal consistency, convergent validity and discriminant validity (Gefen and Straub 2005). However, similar measures cannot be used to assess the quality of measurement items when constructs are measured using formative indicators (Diamantopoulos and Winklhofer 2001). Therefore, there is no straight forward method for assessing the validity of formative measurement items. For formative constructs, as long as the indicators selected conceptually represent the domain of interest, they may be considered adequate from the standpoint of empirical prediction (Coltman et al. 2008). For measuring informed culture, we drew on its definition (Weick and Sutcliffe 2001) in order to come up with seven indicators that represented the total domain of interest for the construct. An indirect measure of validity and reliability of formative constructs is assessing inter-rater agreement (MacKenzie et al. 2005). In this study, all items went through rounds of unlabeled and labeled sorting. As described above, in the labeled sorting, sorters were provided with a definition of the construct. It was found that there was a very high level of agreement between the sorters in terms of which item belonged to which construct and over 94% of the items we correctly sorted into the constructs that they intended to measure. A single score summated scale for informed culture was created by averaging the items.

Further, for the personality measurement scales, previous research has suggested that authors should limit their use of different validity measures to assess the validity of the scales as various measures of validity are often found not to reflect a true picture of the validity of the scales and lack in utility (Piedmont et al. 2000, Johnson 2005). Therefore, in order to improve the quality of personality assessment, we adopted the widely used IPIP scales (Goldberg et al. 2006) for assessing Openness to Experience and Conscientiousness. Single measures for the personality factors were obtained by following the scoring criteria suggested in the IPIP website (IPIP 2008).

For the two constructs that were measured using the reflective indices, internal consistency was examined using composite reliability and Cronbach's alpha. As shown in Table 2, the composite reliability of both constructs are above the suggested threshold of 0.7 (Chin 1998a; Chin 1998b; Straub 1989), thus indicating reliable measures.

Convergent validity indicates the extent to which the items of a scale that are theoretically related are also related in reality. Convergent validity measures the correlation among item measures of a given construct using different methods of measurement. Table 2 presents information about the factor loadings of the measures of our research model. All items have significant path loadings at the 0.001 level. The average variance extracted (AVE) values are are higher than the recommended value of 0.50 (Fornell and Larcker 1981). Therefore, the convergent validity of the reflective scales are acceptable.

Table 2. Psychometric Properties of Measurement Model for the Reflective Constructs

Construct	Item	Factor Loadings	Composite Reliability	Cronbach's Alpha	AVE
Radicalness	Radical1 Radical2 Radical3	0.899 0.949 0.943	0.951	0.923	0.867
Decision-maker Mindfulness in RFID Adoption	Mindful1 Mindful2 Mindful3 Mindful4	0.789 0.778 0.798 0.780	0.866	0.798	0.619

Reflective measures are said to have sufficient discriminant validity when the AVEs for each construct is greater than the square of the correlations among the constructs, indicating that more variance is shared between the construct and its measurement items than with another construct represented by a different set of measurement items. In Tables 3 for each of the two constructs measured using reflective items, the square root of the AVE (shown as diagonal elements), are higher than the correlations between the constructs.

Table 3. Correlations between Constructs					
	Openness to Exp.	Conscientiousness	Informed Culture	Radicalness	Mindfulness
Openness to Exp.	**--**				
Conscientiousness	0.504	**--**			
Informed Culture	0.448	0.450	**--**		
Radicalness	0.264	0.311	0.284	**0.931**	
Mindfulness	0.460	0.435	0.476	0.379	**0.787**

Note: Diagonal elements (in bold) are the square roots of the average variance extracted (AVE)

Another method of assessing discriminant validity for reflective items is through factor loadings and cross loadings. Table 4 shows the factor loadings and cross loadings of the measurement items. Scanning down the columns indicate that the item loadings in their corresponding columns are all higher than the loadings of items used to measure the other constructs. Scanning across rows indicate that item loadings are higher for their corresponding constructs than for other constructs.

Table 4. Factor Loadings and Cross-loadings					
	Conscientiousness	Informed Culture	Mindfulness	Openness to Exp.	Radicalness
Radical1	0.2789	0.1684	0.3061	0.2374	**0.8997**
Radical2	0.2944	0.2998	0.3449	0.2411	**0.9499**
Radical3	0.2947	0.3097	0.3968	0.2578	**0.9434**
Mindful1	0.2980	0.3470	**0.7896**	0.3259	0.3089
Mindful2	0.1718	0.2680	**0.7783**	0.2198	0.2565
Mindful3	0.4625	0.4413	**0.7988**	0.3916	0.2780
Mindful4	0.3629	0.3963	**0.7804**	0.4493	0.3351
InformCul1	0.3677	**0.8640**	0.4114	0.3372	0.2802
InformCul2	0.2448	**0.7040**	0.3353	0.2409	0.3239
InformCul3	0.2443	**0.3351**	0.1596	0.1083	0.1802
InformCul4	0.2677	**0.4253**	0.2025	0.1636	0.2174
InformCul5	0.3653	**0.7398**	0.3523	0.3680	0.2317
InformCul6	0.4434	**0.8527**	0.4061	0.4200	0.1924
InformCul7	0.4276	**0.7861**	0.3743	0.4006	0.2586
PerCons1	**0.5471**	0.2442	0.2381	0.3425	0.2959
PerCons10R	**0.3710**	0.1575	0.1615	0.2610	0.1005
PerCons2	**0.7766**	0.3743	0.3380	0.4658	0.3060
PerCons3	**0.4570**	0.2443	0.1989	0.3444	0.2664
PerCons4	**0.6430**	0.3434	0.2799	0.5344	0.3054
PerCons5	**0.4981**	0.3270	0.2168	0.4241	0.2426
PerCons6R	**0.2372**	0.2526	0.1033	0.2201	0.1549
PerCons7R	**0.3066**	0.2840	0.1334	0.2667	0.1013
PerCons8R	**0.1499**	0.1535	0.0653	0.1775	0.0579
PerCons9R	**0.4883**	0.2903	0.2125	0.2100	0.0781
PerOpen1	0.2575	0.1475	0.1078	**0.2343**	0.0522
PerOpen10R	-0.0111	0.0637	0.0954	**0.2074**	-0.0228
PerOpen2	0.3623	0.3874	0.3153	**0.6853**	0.2060
PerOpen3	0.1265	0.1838	0.1556	**0.3382**	0.2044
PerOpen4	0.2861	0.3025	0.3197	**0.6949**	0.3020
PerOpen5	0.5666	0.4510	0.4006	**0.8707**	0.2718
PerOpen6R	0.0329	0.0573	-0.0101	**-0.0219**	0.0165
PerOpen7R	0.0661	0.0006	0.0448	**0.0975**	-0.0786
PerOpen8R	0.0797	0.0131	0.0927	**0.2015**	-0.0644
PerOpen9R	0.0765	0.0161	-0.0286	**-0.0621**	-0.0507

Thus, all items measuring the reflective constructs satisfy the criteria for discriminant validity as suggested by Chin (1998b). The factor analysis also indicated that these items could be averaged to create summated scales for each construct. Table 5 provides the descriptive statistics for the summated variables.

Table 5. Descriptive Statistics for Summated Variables

Construct	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Openness to Exp.	2.80	6.60	4.75	0.780	-0.041	-0.205
Conscientiousness	2.80	7.00	5.39	0.787	-0.435	0.287
Informed Culture	3.00	7.00	5.04	0.919	-0.188	-0.516
Radicalness	1.67	7.00	5.11	1.099	-0.745	0.864
Mindfulness	3.00	7.00	5.27	0.831	-0.261	-0.397

Structural Model

In order to assess the research model using multiple regression analysis, the data was analyzed to ascertain that the normality and linearity conditions were satisfied. Normality was visually assessed through the histograms of frequencies of the variables, and also by examining the skewness and kurtosis statistic. All skewness and/or kurtosis values were found to be within the acceptable range of -2 to 2 (Table 5). Scatterplots between the predicted variable and each predictor indicated that the linearity assumptions were not violated in the dataset. Two separate regression models were tested in order to assess the main effects as well as the moderated effects. Table 6 reports the results of the regression analysis. The multicollinearity diagnostics (variance inflation factor, condition indices and eigenvalues) were assessed for both models and it was found that the models did not suffer from multicollinearity. In order to ascertain that the assumption regarding homoscedasticity is satisfied, for each regression model the residuals were plotted against the predicted value, and the plots indicated that the variances in the data were homogeneous.

Table 6 Regression Results: Dependent Variable (Mindfulness)

Variables	Standardized Coefficients (B)	T	Sig.
Model 1 **(R^2 = 0.419; Adjusted R^2 = 0.406; F = 31.246; Sig = 0 .000)**			
Openness to Experience	**.174**	**2.340**	**.021**
Conscientiousness	**.236**	**3.069**	**.003**
Informed Culture	**.410**	**5.411**	**.000**
Model 2 **(R^2 = 0.424; Adjusted R^2 = 0.410; F = 31.871; Sig = 0 .000)**			
Informed Culture	**.404**	**5.338**	**.000**
Radical x Conscientious	**.246**	**3.254**	**.001**
Openness	**.181**	**2.470**	**.015**
Conscientiousness	**.134**	**1.403**	**.163**
Radicalness	**-.126**	**-.867**	**.388**
Radical x Informed Culture	**-.316**	**-1.586**	**.115**

Model 1 tested only the main effects of the two personality factors and informed culture on decision-maker mindfulness in RFID adoption. Overall the regression model was significant and had a high predictability, explaining over 40% of the variation in decision-maker mindfulness. Conscientiousness and informed culture are significantly associated with decision-maker mindfulness ($p<.01$), while openness to experience is somewhat associated ($p<.05$). Therefore hypotheses 1, 2 and 3 were supported in Model 1.

In order to test the moderating effect of radicalness, the two interaction terms were calculated by multiplying radicalness with informed culture, and radicalness with conscientiousness. Model 2 tested the effect of the individual predictor variables as well as the moderator terms on decision-maker mindfulness. Individual terms and moderator terms were introduced into the regression model and stepwise regression analysis was used. Stepwise regression in particularly useful when testing interaction effects, as both individual terms and interaction terms can be

simultaneously introduced into the regression analysis and their relative importance in explaining the variation in the predicted variable can be assessed.

It was found that while model 2 explained nearly the same amount of variation in decision-maker mindfulness, radicalness had a significant moderating effect on the relationship between conscientiouness and decision-maker mindfulness. However, the hypothesized moderating effect of radicalness on informed culture was not significant in the model, and informed culture only had a significant main effect. Therefore, in model 2, hypotheses 1, 3 and 4a were supported, while 4b was not supported by the dataset.

Discussion

The notion of mindfulness has been receiving heightened interest in the context of different aspects of organizational functioning and decision-making such as media selection and use for organizational communications (Timmerman 2002), organizational learning and attention (Levinthal and Rerup 2006, Weick and Sutcliffe 2006), entrepreneurship behavior (Rerup 2005) and organizational innovation diffusion (Fichman 2004; Fiol and O'Connor 2003; Swanson and Ramiller 2004). While mindfulness is generally considered to be a favorable property or characteristic to possess both at the individual level as well as the organization level, there is little research to identify the factors that determine or contribute towards mindfulness. Recognizing the role of individual decision-makers in overall organizational mindfulness (Swanson and Ramiller 2004), this study identifies the factors that determine decision-maker mindfulness in the context of innovation adoption in organizations.

This research found that individual personality traits such as openness to experience and conscientiousness are significantly associated with decision-maker mindfulness in RFID adoption. Given that RFID adoption is an organizational decision, the role of organizational culture is investigated. A prevailing informed culture in the organization was found to have significant positive association with decision-maker mindfulness in RFID adoption. These findings emphasize the role of individual as well as organizational characteristics when assessing decision-maker mindfulness in the context of IT innovation adoptions.

Innovation radicalness was hypothesized to have a moderating effect on the role of conscientiousness and informed culture as determinants of decision-maker mindfulness. It was found that while technology radicalness moderated the relationship between conscientiousness and mindfulness, it had no effect on the relationship between informed culture and mindfulness. The results indicate that when faced with a highly radical innovation the personality trait of conscientiousness will have a stronger effect on mindfulness. Because of their thorough, deliberate and persistent nature, conscientious individuals will be less prone to simplify a complex situation. Since a radical innovation is likely to present a complex decision-making scenario marked with uncertainty and lack of understanding regarding the technology and the contextual factors associated with its adoption, conscientiousness will make organizational decision-makers willing to thoroughly analyze and deliberate on the situation before deciding.

Contrary to our expectation, radicalness does not moderate the relationship between informed culture and decision-maker mindfulness. The adoption of a radical innovation constitutes a more risky decision-making scenario with high chances of failure. In an organization that encourages informed culture, decision-makers are able to report unfavorable outcomes or failures from risky endeavors and learn from them, without the fear of negative consequences. Within such organizations, it is therefore unlikely that their decision-making or the mindfulness in decision-making is influenced by the extent to which the technology is radical. In other words, decision-making is not constrained by the extent to which the decision or its consequences are risky or prone to failure. Given such a circumstance, it is likely that innovation radicalness will not be an important consideration in their adoption decision-making. Consequently, radicalness does not have an effect on the role of informed culture in determining decision-maker mindfulness. Innovation radicalness can also be measured in absolute terms by asking a panel of experts (e.g., Ettlie et al. 1984). While both approaches of measuring innovation radicalness have their own merits, radicalness measured in absolute terms may have a significant moderating effect on the role of informed culture as well as conscientiousness in determining decision-maker mindfulness. Therefore, future studies can be designed to measure radicalness in absolute terms as perceived by the society or industry (Anderson and Tushman 1990, Tushman and Anderson 1986) and then investigate its role in determining decision-maker mindfulness in innovation adoption. However, such studies will have to simultaneously consider more than one technological innovation having varying degrees of radicalness in order to be able to truly gauge the role of radicalness in determining mindfulness in innovation adoption decision-making.

Contributions

This research furthers existing research on mindfulness in organizational innovation adoption. Research in human psychology has suggested that the property of mindfulness shows both trait-like and state-like characteristics (Brown and Ryan 2003). Based on the 'trait-like' view of mindfulness, we identify the two human personality factors that are the most likely to be related to mindfulness. A 'state-like' view suggests that there could be factors external to the individual that result in differences in mindfulness. Based on this view, it is proposed that organizational culture, more specifically, an informed culture (Reason 1997; Weick and Sutcliffe 2001) plays a significant role in determining individual decision-maker's mindfulness. This study empirically validated the role of openness to experience, conscientiousness and informed culture in determining decision-maker mindfulness, and the moderating effect of innovation radicalness on the relationship between conscientiousness and mindfulness. However, there was no empirical support for the moderating effect of radicalness on the relationship between informed culture and decision-maker mindfulness in IT innovation adoption. Future empirical studies can be designed to capture radicalness at a different level in order to ascertain its role in determining mindfulness.

The proposed model in this study is not only applicable in the context of organizational innovation adoption, but can also be applied to assess decision-maker mindfulness in other areas of strategic decision-making within the organization. For example, it has been suggested that mindfulness can help in recognizing and exploiting opportunities from entrepreneurial endeavors (Rerup 2005). Therefore, a theoretical model that identifies the antecedents or determinants of mindfulness in strategic decision-making can significantly contribute to the overall strategic management literature.

For practitioners, this study lays down initial guidelines regarding the characteristics that should be considered important in managers responsible for strategic decision-making within organizations. While this research discusses mindfulness primarily in the context of IT innovation related decision making, we believe that mindfulness will play an important role in different kinds of strategic decision making, and therefore the findings from this research are relevant in various strategic decision making scenarios. Previous studies have often considered conscientiousness as an indicator of workplace performance (Salgado 1997). This study adds to the extant literature on the role of human personality in organizational behavior by showing that the personality trait of openness to experience is positively associated with decision-maker mindfulness. Therefore, in addition to conscientiouness, practitioners should also consider openness to experience when assessing individuals, especially those that will be in charge of performing non-routine tasks such as strategic decision-making. Further, it has been shown that individuals can be trained to be more mindful (Kabat-Zinn 1990). This has important implication for practitioners, as it essentially says that managers can be trained to be more mindful. Thus, researchers along with practitioners can direct research efforts in tailoring executive training programs with the aim of training managers in strategic mindfulness.

Limitations

In this study all the constructs were measured using a single respondent. This introduces the threat of common method bias. Although care was taken during the operationalization and design of the questionnaire to minimize the threats posed by common method bias, we realize that some of the variance could be attributed to common method bias (Podsakoff et al. 2003). While it has been found that in IS research structural relationships remain significant even when adjusted for common method variance (Malhotra et al. 2006), future studies could aim towards measuring some of the constructs from different sources. For instance, informed culture and radicalness can be measured from different sources. Another limitation is that out of the five big personality factors, this study focuses on only openness to experience and conscientiousness. Theoretically these two personality factors are the most closely associated with decision-maker mindfulness, however, future research can also be directed assessing the implications of the other three factors of the big five personality model on decision-maker mindfulness.

Conclusion

There is a growing appreciation of the need for using cognitive theories to understand strategic behaviors, including various IS/ IT related behaviors. With this intention in mind, this study uses a cognitive lens to get a better understanding of the role of human cognition, more specifically decision-maker mindfulness in information technology innovation adoption decision making. Drawing from research in psychology, organization research, and innovation research, determinants of decision-maker mindfulness in the context of RFID adoption and identified and their roles are empirically validated using survey research methodology.

References

Anderson, P. and Tushman, M. L. "Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change," *Administrative Science Quarterly* (35), 1990, pp. 604-633.

Brach, M. (2003). *Real Options in Practice*, John Wiley and Sons., NJ.

Brown, K. W. and Ryan, R. M. (2003). "The Benefits of Being Present: Mindfulness and Its Role in Psychological Well-Being", *Journal of Personality and Social Psychology*, **84**(4), pp.822-848.

Chin, W. W. "Issues and Opinion on Structural Equation Modeling," *MIS Quarterly* (22:1), 1998a, pp. vii-xvi.

Chin, W. W. "The Partial Least Squares Approach for Structural Equation Modeling," in *Modern Methods for Business Research*, G. A. Marcoulides (Ed.), Lawrence Erlbaum Associates, Hillsdale, NJ, 1998b, pp. 295-336.

Coltman, T. R., Devinney, T. M., Midgley, D. F. and Venaik, S. "Formative versus Reflective Measurement Models: Two Applications of Formative Measurement," Journal of Business Research, 2008 (In press).

Damanpour, F. "Innovation Type, Radicalness, And The Adoption Process," Communication Research (15:5), 1988, pp. 545-567.

Dewar, R. D. and Dutton, J. E. "The Adoption of Radical and Incremental Innovations: An Empirical Analysis," *Management Science* (32:11), 1986, pp. 1422-1433.

Diamantopoulos, A. Winklhofer, H. M. "Index construction with formative indicators: an alternative to scale development," *Journal of Marketing Research* (38:5), 2001, pp. 269-277.

DiMaggio, P. and Powell, W. W. "The Iron-Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields," *American Sociological Review* (48:2), 1983, pp. 147-160.

Ettlie, J. E., Bridges, W. P. and O'Keefe, R. D. "Organization Strategy and Structural Differences for Radical versus Incremental Innovation." *Management Science* (30:6), 1984, pp. 682-695.

Fichman, R. G. (2004). "Going Beyond the Dominant Paradigm For Information Technology Innovation Research: Emerging Concepts and Methods", *Journal of the AIS*, **5**(8).

Fichman, R.G. and Kemerer, C.F. (1997). "The Assimilation of Software Process Innovations: An Organizational Learning Perspective", *Management Science* **40**(10), pp.1345-1363.

Fiol, C. M. and O'Connor, E. J. (2003). "Waking Up! Mindfulness in the Face of Bandwagons", *Academy of Management Review*, **28**(1), pp.54-70.

Fiske, S. T. and Taylor, S. E. (1991). *Social Cognition.* 2nd Ed. McGraw-Hill, New York.

Fornell, C. and Larcker, D. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (18:1), 1981, pp. 39-50.

Gefen, D. and Straub, D. W. "A Practical Guide to Factorial Validity using PLS-Graph: Tutorial and Annotated Example," *Communications of the AIS* (16), 2005, pp. 91-109.

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., and Gough, H. C. "The International Personality Item Pool and the future of public-domain personality measures,"*Journal of Research in Personality* (40), 2006, pp. 84-96.

Guilford, J. P. (1967). *The Nature of Human Intelligence*. McGraw-Hill, New York.

Hair, J. F., Andersen, R. E., Tatham, R. L. and Black, W. C. *Multivariate Data Analysis*, 1998, Prentice-Hall.

International Personality Item Pool: A Scientific Collaboratory for the Development of Advanced Measures of Personality Traits and Other Individual Differences (http://ipip.ori.org/). Last accessed on 20/08/2008

Johnson, J. A. "Ascertaining the validity of individual protocols from Web-based personality inventories," *Journal of Research in Personality* (39:1), 2005, pp. 103-129

Kimberly, J. R. (1981) "Managerial Innovation" in *Handbook of Organizational Design* eds. P. C. Nystrom and W. H. Starbuck, vol. 1(84-104), Oxford University Press, New York.

Kabat-Zinn, J. (1990). Full Catastrophe Living: Using the Wisdom of your Body and Mind to face Stress, Pain and Illness. Delacourt, New York.

Langer, E. J. (1989). *Mindfulness.* Addison Wesley, Reading, MA.

Langer, E. J. (1997). *The Power of Mindful Learning.* Addison Wesley, Reading, MA.

Levinthal, D. and Rerup, C. "Crossing an Apparent Chasm: Bridging Mindful and Less-Mindful Perspectives on Organizational Learning," *Organization Science* (17:4), 2006, pp. 502-513.

MacKenzie, S. B., Podsakoff, P. M. and Jarvis, C. B. "The Problem of Measurement Model Misspecification in Behavioral and Organizational Research and Some Recommended Solutions" *Journal of Applied Psychology* (90:4), 2005, pp. 710-730.

Malhotra, N. K., Kim, S. S. and Patil, A. "Common Method Variance in IS Research: A Comparison of Alternative Approaches and a Reanalysis of Past Research" *Management Science* (52:12), 2006, pp. 1865-1883.

Martin, J. R. (1997). "Mindfulness: A Proposed Common Factor", *Journal of Psychotherapy Integration*, **7**, pp.291-312.

McCrae, R. R. (1987). "Creativity, Divergent Thinking and Openness to Experience", *Journal of Personality and Social Psychology*, **52**(6), pp.1258-1265.

McCrae, R. R. (1996). "Social Consequences of Experiential Openness," *Psychological Bulletin* (120), 1996, pp. 323-337.

McCrae, R. R. and Costa, P. T. (2003). *Personality in Adulthood, a Five-Factor Theory Perspective* (2nd ed.). Guilford Press, New York.

Moore, G. C., and Benbasat, I. "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation," *Information Systems Research* (2:3), 1991, pp. 173-191.

Piedmont, R. L., McCrae, R. R., Riemann, R. and Angleitner, A. "On the invalidity of validity scales: Evidence from self-reports and observer ratings in volunteer samples," *Journal of Personality and Social Psychology* (78:3), 2000, pp. 582-593.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y. and Podsakoff, N. P. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88:5), 2003, pp. 879-903.

Reason, J. T. (1997). *Managing the Risks of Organizational Accidents.* Ashgate, Aldershot, England.

Rerup, C. "Learning from Past Expereince: Footnotes on Mindfulness and Habitual Entrepreneurship," *Scandinavian Journal of Management* (21:4), 2005, pp. 451-472.

Ryckman, R. (2004). *Theories of Personality.* Thomson/Wadsworth, Belmont, CA.

Salgado, J. F. "The Five Factor Model of Personality and Job Performance in the European Community," Journal of Applied Psychology (82:1), 1997, pp. 30-43.

Schein, E. H. (1985). *Organization Culture and Leadership: A Dynamic View.* Jossey-Bass, San Francisco, CA.

Sharma, S., Durand, R. M. and Gur Arie, O. "Identification and Analysis of Moderator Variables," Journal of Marketing Research (18:2), 1981, pp. 291-300.

Spender, J. C. (1989). Industry Recipes. Backwell, New York.

Sternberg, R. J. (2000). "Images of Mindfulness", *Journal of Social Issues* **56**(1), pp.11-26.

Stone, E. F. *Research Methods in Organizational Behavior*. Goodyear, Santa Monica, CA, 1978.

Straub, D.W. "Validating instruments in MIS research," *MIS Quarterly* 13(2), 1989, pp. 147-169.

Swanson, E. B. and Ramiller, N. (1997). "The Organizing Vision of Information Systems Innovations", *Organization Science* **8**(5), pp.458-474.

Swanson, E. B. and Ramiller, N. (2004). "Innovating Mindfully with Information Technology", *MIS Quarterly*, **28**(4), pp.553-583.

Teo, H. H., Wei, K. K. and Benbasat, I. "Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective," *MIS Quarterly* (27:1), 2003, pp. 19-49.

Timmerman, C. E. "The Moderating Effect of Mindlessness/Mindfulness upon Media Richness and Social Influence Explanations of Organizational Media Use," Communication Monographs (69:2), 2002, pp. 111-131.

Tornatzky, L. G. and Fleischer, M. (1990). *The Processes of Technological Innovation.* Lexington Books, Lexington, MA.

Tushman, M. L. and Anderson, P. "Technological Discontinuities and Organizational Environments," *Administrative Science Quarterly* (31:3), 1986, pp. 439-465.

Weick, K. E. (1995). *Sensemaking in Organizations.* Sage, Thousand Oaks, CA.

Weick, K.E. and Sutcliffe, K. M. (2001). Managing the Unexpected: Assuring High Performance in an Age of Complexity. Jossey-Bass, San Francisco, CA.

Weick, K.E. and Sutcliffe, K. M. "Mindfulness and the Quality of Organizational Attention," *Organization Science* (17:4), 2006, pp. 514-524.

Wilson, A. L., Ramamurthy, K. and Nystrom, P. C. "A Multi-Attribute Measure for Innovation Adoption: The Context of Imaging Technology," *IEEE Transactions on Engineering Management* (46: 3), 1999, pp. 311-321.